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Stationary Power Distribution Unit (SPDU) 3-phase, 75-300 kVA

Technical Handbook

APC's Stationary Power Distribution Unit (SPDU) was designed for application in various 3-phase environments. The SPDU can provide up to 11 sub-feed breakers, and offers the option of increasing the number of panel boards by adding sidecars. Top and bottom cable entry are standard. Other features include total front accessibility, K1-K20 transformers, and protective shielding.

This handbook provides a comprehensive overview of the SPDU. It includes a marketing perspective and a technical rundown on the various product iterations that can be created from the basic design. APC's SPDU was manufactured and tested in accordance with current industry standards.

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Section 1: General Information

SPDU visuals

SPDU with front doors open

SPDU with front panels open

SPDU with sidecar (on left)

Positioning statement

The superior design flexibility of APC's 3-phase Stationary Power Distribution Units (SPDUs) satisfies a wide range of customer requirements. The SPDU can deliver up to 300 kVA of power, and provides more sub-feed breakers per service area than any other model in its operational class. This translates into a highly efficient and effective distribution of power. The SPDU also boasts the smallest overall footprint in its class, leaving more space available for revenue-generating products in the data center or IT environment.

The APC SPDU (75-300 kVA) is designed for use with APC's large Silcon Delta Conversion On-line Technology Series™ of uninterruptible power supplies (UPS). Used in tandem, the Silcon Series and APC's SPDU are an ideal power protection and management solution for internet infrastructure, data center, and enterprise applications.

Features and benefits

Space savings.

- Smallest overall footprint of any model in its operating class.
- Optimal operational and service features.
- Service takes place solely through the front doors, so the SPDU can be positioned next to a wall or other equipment, preserving space for revenue-generating products.

Performance.

- Delivers up to 300 kVA of power.
- Provides more sub-feed breakers per service area than any unit in its class.
- Highly efficient and effective distribution of power-to-load throughout the facility.

Flexibility/scalability.

- Offers a multitude of distribution options to satisfy a wide range of customer requirements.
- Sidecars can be mounted on either side of the main unit and daisy-chained (if necessary) to incrementally increase the number of panel boards available to the system.
- Top and bottom cable entry.

Manageability.

- Local and web-based monitoring of SPDU equipment is possible both at the data center and via the Web.

Adaptability.

- Built-in, vertical cooling airflow feature allows for ready integration into both raised floor and non-raised floor environments.
- Unit comes equipped with an interchangeable set of casters and adjustable leveling feet. The SPDU can thus be rolled into position on its casters and then stabilized by lowering and adjusting its leveling feet.

Serviceability.

- All service is accomplished via front access. Other manufacturers make the same claim, but this is the only PDU that truly provides front access for each and every aspect of product servicing.
- Forward-facing sidecar panels are also fully serviceable through the front door, eliminating the need for additional service space.
- The use of quarter-turn fasteners on all hinged panels enhances serviceability and decreases repair time by permitting ready access to enclosures.

Conformance.

- The APC SPDU is the first PDU to receive UL 60950 certification, signifying adherence to the most recent UL and IEC guidelines.

Custom configurations and options

Product SKUs. There are 21 SPDU product SKUs available. These are basically broken down into seven (7) levels of output power (75, 100, 125, 150, 200, 225, or 300 kVA) and three (3) types of transformers (K1, K13, and K20).

- *PD75G6FK1*
- *PD75G6FK13*
- *PD75G6FK20*
- *PD100G6FK1*
- *PD100G6FK13*
- *PD100G6FK20*
- *PD125G6FK1*
- *PD125G6FK13*
- *PD125G6FK20*
- *PD150G6FK1*
- *PD150G6FK13*
- *PD150G6FK20*
- *PD200G6FK1*
- *PD200G6FK13*
- *PD200G6FK20*
- *PD225G6FK1*
- *PD225G6FK13*
- *PD225G6FK20*
- *PD300G6FK1*
- *PD300G6FK13*
- *PD300G6FK20*

Dual-feed main breakers. The product is equipped with any of five (5) types of dual-feed main breakers.

- *225A (p/n PDCBRF225)*
- *400A (p/n PDCBRK400)*
- *600A (p/n PDCBRL600)*
- *800A (p/n PDCBRM800)*
- *1200A (p/n PDCBRN1*200)

Panel boards/sub-feed breakers. The product can be equipped with any of the following combinations of panel boards/sub-feed breakers.

- *Two 42-pole panel boards (2 x p/n PDPNLPL1A)*
- *One 42-pole panel board and up to seven 225A sub-feed breakers (1 x p/n PDPNLPL1A and 7 x p/n PDCBRF225SF)*
- *One 42-pole panel board and up to three 400A sub-feed breakers (1 x p/n PDPNLPL1A and x PDCBRK400SF)* 3
- *Up to eleven 225A sub-feed breakers (11 x p/n PDCBRF225SF)*

Note

The terminology “up to...” refers to the maximum number of sub-feed breakers available in that particular combination. Lesser numbers can also be provided.

Sidecar(s). One or more sidecars (p/n PDSC100 for 75-225[K13] kVA units, and p/n PDSC300 for the 225[K20] unit and all 300 kVA units) can optionally be attached to the main unit (via hard bus) to increase the SPDU's overall load distribution capability. The customer must also decide whether to add one or two 42-pole panel boards (p/n PDPNLPL1A) to each optionally ordered sidecar. Sidecars can be attached to either or both sides of the SPDU and daisy-chained, if necessary.

The number of sidecars that can be added to a single SPDU is only limited by the size of the transformer and the maximum available current.

Monitoring. Three (3) levels of SPDU monitoring are available.

- ***Basic*** (p/n PDBMN100) continuously monitors the temperature of the transformer, the status of the main input circuit breaker, and the status of a remote alarm contact. Local audio and visual alarms are initiated when the core temperature of the transformer exceeds maximum parameters. The main input circuit breaker is then tripped or the remote alarm contact is closed.
- ***Advanced*** (p/n PDAMN100) uses a microprocessor-based power monitor that is capable of sensing, processing, and locally displaying information relating to output voltages for all three phases of line-to-line and line-to-neutral circuitry; all three phases of output current, output frequency, and output power; as well as minimum and maximum acceptable values.
- ***Premium*** (p/n PDPMN100) likewise uses a microprocessor-based power monitor capable of sensing, processing, and displaying an extensive array of operational data. This level additionally allows both local and remote access to information relating to output voltages for all three phases of line-to-line and line-to-neutral circuitry; all three phases of output current, output neutral, output ground, output frequency, and output power; as well as minimum and maximum values, K factor, crest factor, discrete input and output status, analog input readings, and any combination of up to seven metered values.

The above levels should not be considered the only three options for SPDU monitoring. Various elements of each can be mixed and matched to create the best-possible solution for each customer.

Manual restart. Manual restart (p/n PDMRS100) is optionally available as an alternative means of restarting the SPDU in the event input power is lost. This circuit automatically energizes the shunt trip mechanism in the main input circuit breaker.

Transient voltage suppression system (TVSS). A transient voltage suppression system or TVSS (various models are available) can be connected at either the input source or at the output from the local panel boards. The TVSS protects the load by clipping voltage transients before they reach the SPDU or the load.

Custom painting. The standard color of the SPDU is basic black. However, the unit can optionally be painted (p/n PDCP100) any other color.

Floor jacks. A set of (four per unit) floor jacks (p/n PDFJ100) can optionally be applied to the SPDU (and each of its attached sidecars) to provide leveling and/or additional clearance for bottom cable feed. The jacks are offered in heights of up to 18 inches, and are adjustable from one to three inches above the base.

Full-frame floor stand. A full-frame floor stand (p/n PDFS100 for 75-225[K13] kVA units, and p/n PDFS130 for the 225[K20] unit and all 300 kVA units) can optionally be applied to the SPDU (and each of its attached sidecars) to provide leveling and bottom cable access independent of a raised floor. The floor stand is constructed of welded steel, and is offered in heights of up to 32 inches with an adjustment range of +/- 3 inches.

Seismic bracing. Seismic bracing (p/n PDSB100) is optionally available as a means of securing the base frame of the SPDU (and each of its attached sidecars) to a concrete floor for those installations where additional stability is either required or desired.

Custom engineering. APC has allocated ample resources for the expressed purpose of responding to requests for custom engineered solutions. A “custom engineered” design involves the use of assemblies and/or components outside the realm of the company’s standard offerings. Such non-standard assemblies and components are typically specified by the customer as a means of satisfying requirements relating to performance, flexibility, durability, cost, or even personal preference.

Note

A condition of APC’s custom engineering process is the ability to SAFELY and FEASIBLY incorporate changes into a new or existing product design.

Section 2: Technical Specifications

Overview of SPDU offerings

Standard features. APC's Stationary Power Distribution Unit (SPDU) combines power distribution with isolation and flexibility. A provision for top and bottom cable feed is standard. Other features include 100% front accessibility, K1-K20 isolation transformers/shielding, and two panel boards with up to 84 pole positions (or any of three panel board alternatives that allow sub-feed breakers to be incorporated into the mix).

Input.

Rated Power kVA:	75, 100, 125, 150, 200, 225, 300
Nominal Input Voltage:	60 Hz @ 208V/480V/600V
K Factor:	K1, K13, K20
Efficiency at Full Load:	96.5 - 98%
Harmonic Distortion:	< 1%
Nominal Impedance:	3 - 5%
Main Incoming Breaker:	65,000 AIC @ 208V / 35,000 @ 480V / 18,000 @ 600V

Output.

Nominal Output Voltage:	208V / 120V
Panel Board Section (choice of):	• Two 42-pole panel boards • One 42-pole panel board and up to (7) 225A sub-feed breakers • One 42-pole panel board and up to (3) 400A sub-feed breakers • Up to (11) 225A sub-feed breakers

Physical.

Maximum Height Dimensions:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97) top box
Maximum Width Dimensions:	36 inches (91.44 cm) for 75 - 225 kVA 45 inches (114.30 cm) for 300 kVA
Maximum Depth Dimensions:	32 inches (81.28 cm) for 75 - 225[K13] kVA 38.5 inches (97.79 cm) for 225[K20] and all 300 kVA
Standard Color:	Black
Units per Pallet:	1 with maximum of two sidecars

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50-55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

Individual product SKUs

PD75G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	96%
Main Breaker Rating:	125A
Maximum Input Current:	90A
Load Capacity:	75 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	12276 BTU/hr
Impedance:	4.50%
Voltage Regulation:	4.52 @ .8 power factor, 3.39 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1270 pounds (576.06 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD75G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	96%
Main Breaker Rating:	125A
Maximum Input Current:	90A
Load Capacity:	75 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	11253 BTU/hr
Impedance:	4.00%
Voltage Regulation:	3.90 @ .8 power factor, 2.74 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1320 pounds (598.74 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD75G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	96%
Main Breaker Rating:	125A
Maximum Input Current:	90A
Load Capacity:	75 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	10912 BTU/hr
Impedance:	4.10%
Voltage Regulation:	4.08 @ .8 power factor, 2.89 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1340 pounds (607.81 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD100G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	96%
Main Breaker Rating:	150A
Maximum Input Current:	120A
Load Capacity:	100 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	15004 BTU/hr
Impedance:	4.18%
Voltage Regulation:	4.16 @ .8 power factor, 3.07 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1525 pounds (691.73 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD100G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	96%
Main Breaker Rating:	150A
Maximum Input Current:	120A
Load Capacity:	100 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	13640 BTU/hr
Impedance:	4.69%
Voltage Regulation:	4.49 @ .8 power factor, 2.82 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1550 pounds (703.07 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD100G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	96%
Main Breaker Rating:	150A
Maximum Input Current:	120A
Load Capacity:	100 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	13129 BTU/hr
Impedance:	3.91%
Voltage Regulation:	3.76 @ .8 power factor, 2.40 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1695 pounds (768.84 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD125G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	96%
Main Breaker Rating:	200A
Maximum Input Current:	150A
Load Capacity:	125 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	20631 BTU/hr
Impedance:	5.83%
Voltage Regulation:	4.41 @ .8 power factor, 3.22 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1555 pounds (705.34 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD125G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	96%
Main Breaker Rating:	200A
Maximum Input Current:	150A
Load Capacity:	125 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	17732 BTU/hr
Impedance:	4.90%
Voltage Regulation:	4.70 @ .8 power factor, 3.01 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1600 pounds (725.75 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD125G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	96%
Main Breaker Rating:	200A
Maximum Input Current:	150A
Load Capacity:	125 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	13299 BTU/hr
Impedance:	4.03%
Voltage Regulation:	3.72 @ .8 power factor, 2.02 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1715 pounds (777.91 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD150G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	97%
Main Breaker Rating:	225A
Maximum Input Current:	180A
Load Capacity:	150 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	22506 BTU/hr
Impedance:	5.87%
Voltage Regulation:	5.65 @ .8 power factor, 3.63 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1590 pounds (721.21 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD150G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	97%
Main Breaker Rating:	225A
Maximum Input Current:	180A
Load Capacity:	150 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	17391 BTU/hr
Impedance:	4.51%
Voltage Regulation:	4.19 @ .8 power factor, 2.39 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1700 pounds (771.11 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD150G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	97%
Main Breaker Rating:	225A
Maximum Input Current:	180A
Load Capacity:	150 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	16368 BTU/hr
Impedance:	3.81%
Voltage Regulation:	3.52 @ .8 power factor, 1.96 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1960 pounds (889.04 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	50 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD200G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	97%
Main Breaker Rating:	300A
Maximum Input Current:	241A
Load Capacity:	200 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	24723 BTU/hr
Impedance:	5.04%
Voltage Regulation:	4.69 @ .8 power factor, 2.64 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	1900 pounds (861.83 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD200G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	97%
Main Breaker Rating:	300A
Maximum Input Current:	241A
Load Capacity:	200 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	20290 BTU/hr
Impedance:	3.89%
Voltage Regulation:	3.54 @ .8 power factor, 1.90 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	2100 pounds (952.54 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD200G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	97%
Main Breaker Rating:	300A
Maximum Input Current:	241A
Load Capacity:	200 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	18926 BTU/hr
Impedance:	3.96%
Voltage Regulation:	3.51 @ .8 power factor, 1.74 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), including removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	2100 pounds (952.54 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), including removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD225G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	97%
Main Breaker Rating:	350A
Maximum Input Current:	271A
Load Capacity:	225 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	28133 BTU/hr
Impedance:	5.33%
Voltage Regulation:	4.92 @ .8 power factor, 2.77 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	2100 pounds (952.54 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD225G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	97%
Main Breaker Rating:	350A
Maximum Input Current:	271A
Load Capacity:	225 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	22847 BTU/hr
Impedance:	4.46%
Voltage Regulation:	3.95 @ .8 power factor, 1.97 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	2300 pounds (1043.26 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	32 inches (81.28 cm)
Net Weight:	520 pounds (253.87 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD225G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	97%
Main Breaker Rating:	350A
Maximum Input Current:	271A
Load Capacity:	225 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	22165 BTU/hr
Impedance:	4.52%
Voltage Regulation:	3.94 @ .8 power factor, 1.86 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	36 inches (91.44 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	2350 pounds (1065.94 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	590 pounds (267.62 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD300G6FK1

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K1
Efficiency:	97%
Main Breaker Rating:	450A
Maximum Input Current:	361A
Load Capacity:	300 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	32736 BTU/hr
Impedance:	6.03%
Voltage Regulation:	5.26 @ .8 power factor, 2.51 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	45 inches (114.30 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	2300 pounds (1043.26 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	590 pounds (267.62 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD300G6FK13

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K13
Efficiency:	97%
Main Breaker Rating:	450A
Maximum Input Current:	361A
Load Capacity:	300 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	26854 BTU/hr
Impedance:	3.94%
Voltage Regulation:	3.44 @ .8 power factor, 1.62 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	45 inches (114.30 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	2700 pounds (1224.70 kg)
Standard Color:	Black

Sidecar physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	590 pounds (267.62 kg)
Standard Color:	Black

Environmental.

Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

PD300G6FK20

Input.

Nominal Input Voltage:	480V, 3PH
Input Frequency (Hz):	60 Hz, +/- 3 Hz
Transformer Type:	K20
Efficiency:	97%
Main Breaker Rating:	450A
Maximum Input Current:	361A
Load Capacity:	300 kVA

Output.

Nominal Output Voltage:	208V / 120V
Full Load Heat Output:	26257 BTU/hr
Impedance:	3.82%
Voltage Regulation:	3.24 @ .8 power factor, 1.40 @ 1.0 power factor
Transformer Taps:	2 @ 2.5% full capacity above nominal, 4 @ 2.5% full capacity below nominal

SPDU physical.

Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	45 inches (114.30 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	2900 pounds (1315.42 kg)
Standard Color:	Black

Sidecar physical.

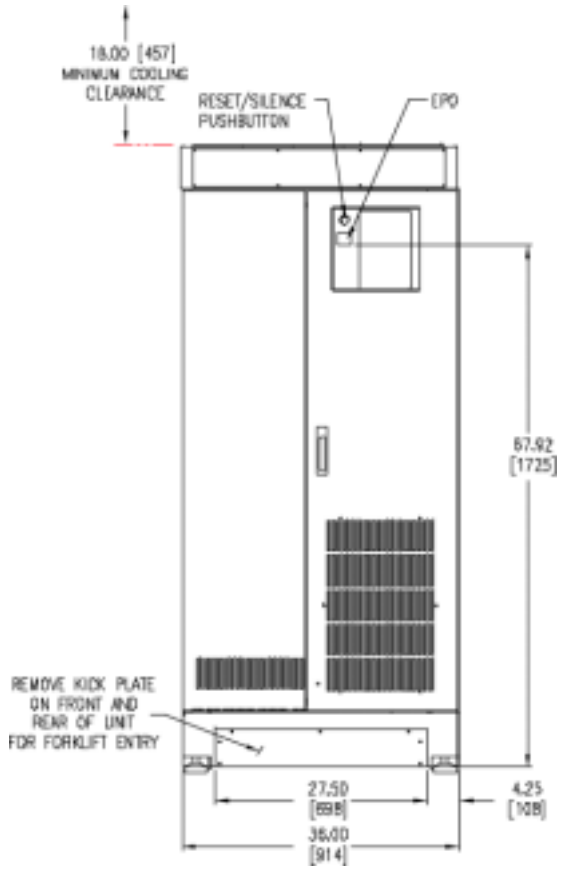
Net Height:	81.5 inches (207.01 cm), includes removable 5.5-inch (13.97 cm) top box
Net Width:	20 inches (50.80 cm)
Net Depth:	38.5 inches (97.79 cm)
Net Weight:	590 pounds (267.62 kg)
Standard Color:	Black

Environmental.

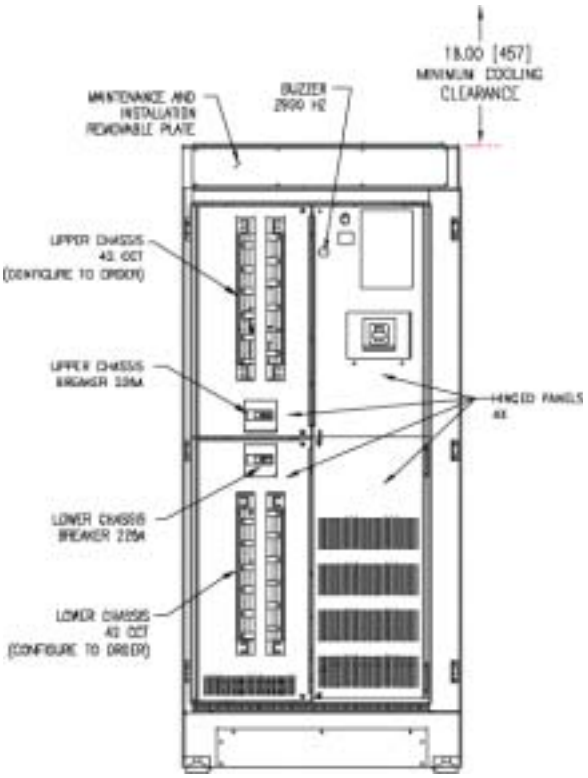
Operating Environment:	0 - 40°C (32 - 104°F)
Operating Relative Humidity:	0 - 95%, non-condensing
Audible Noise:	55 decibels
Protection Class:	NEMA 1
UL Certification:	UL60950

Section 3: Line Drawings

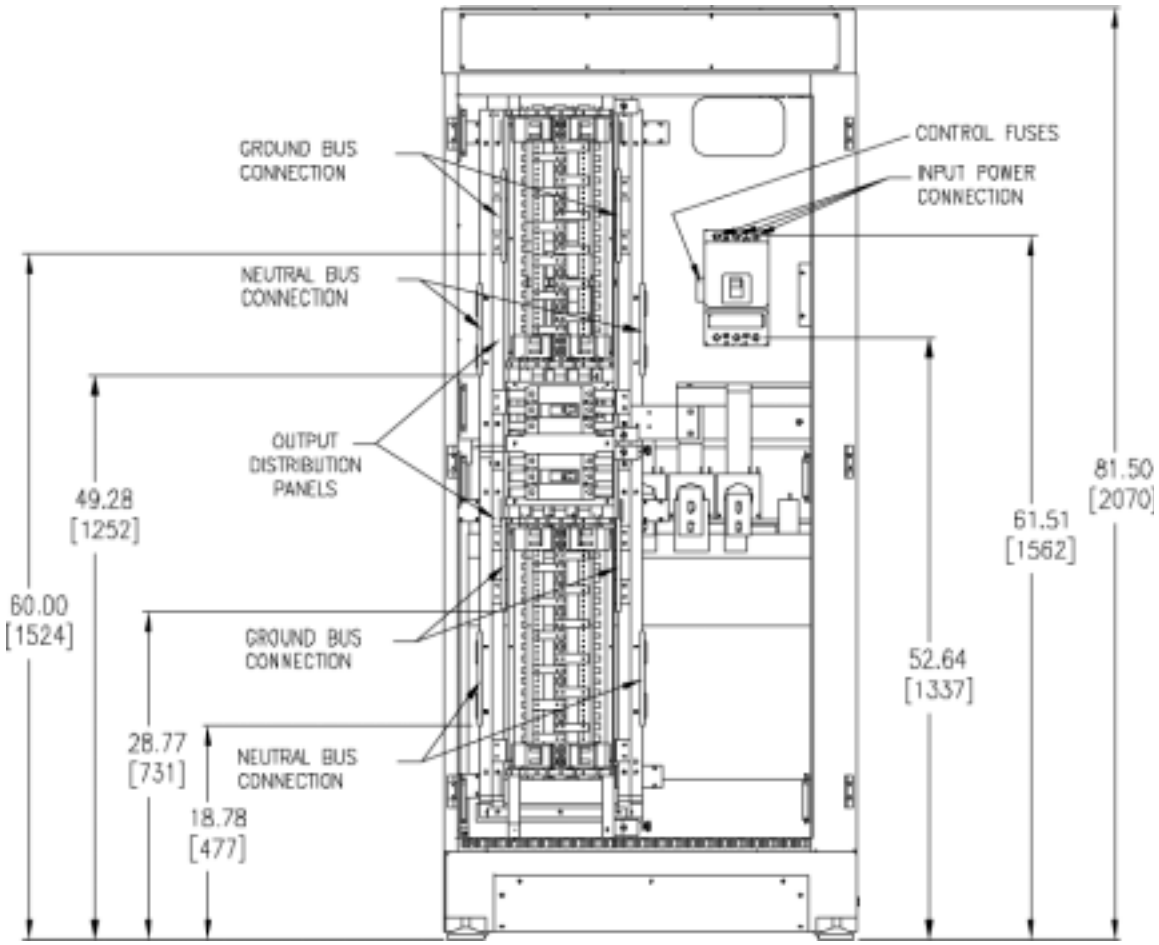
SPDU (75 - 225 kVA)



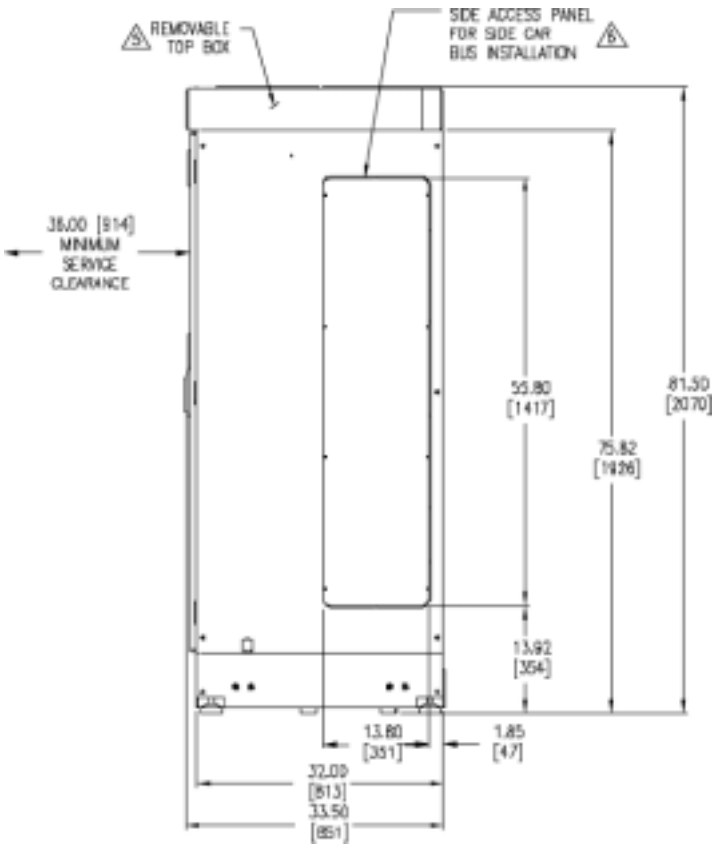
SPDU (75-225) front view intact



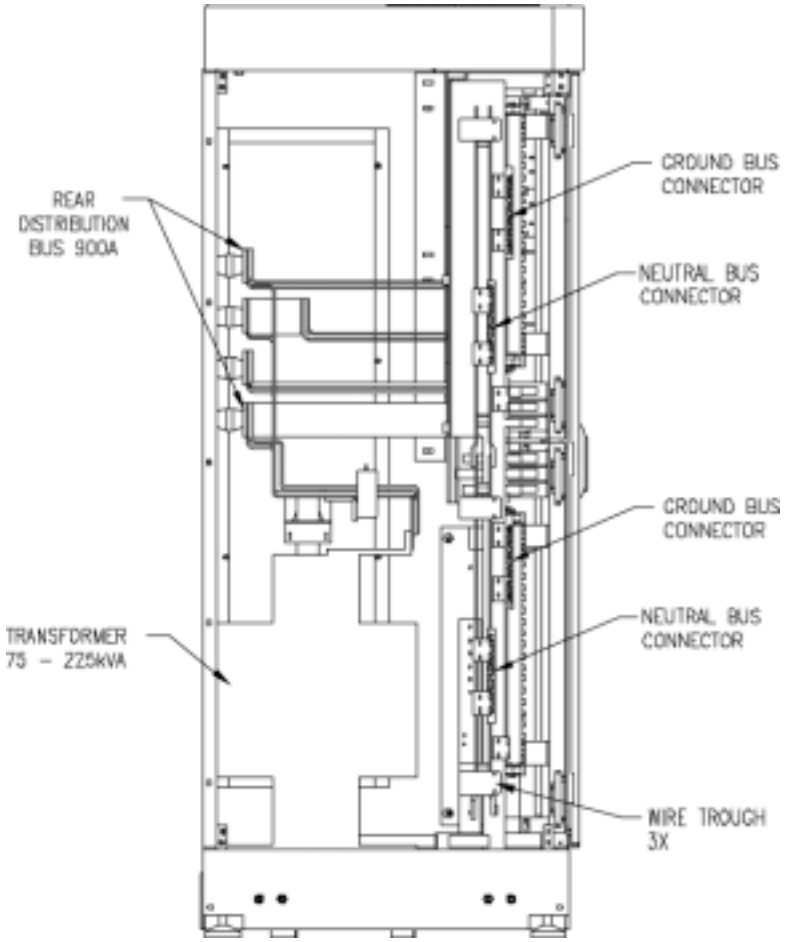
SPDU (75-225) front doors removed



SPDU (75-225) front internal components

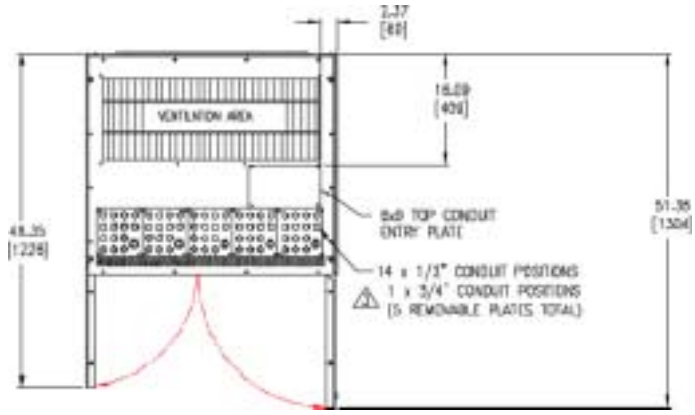


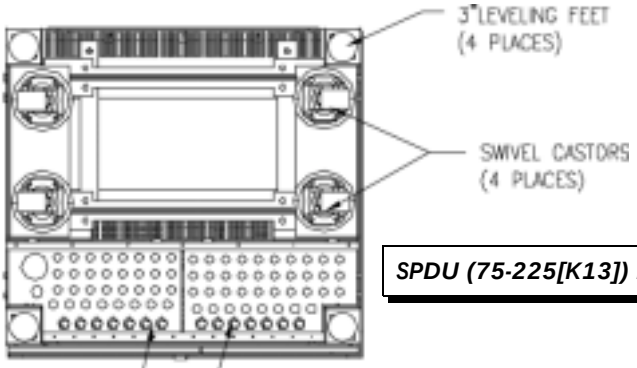
SPDU (75-225[K13]) right side intact



SPDU (75-225[K13]) left side internal components

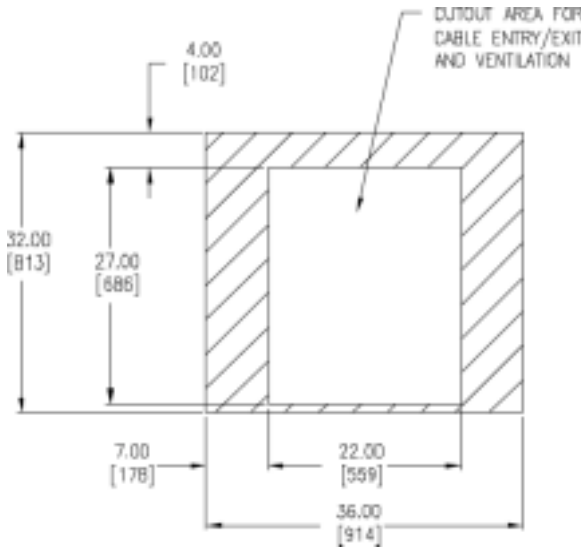
SPDU (75-225[K13]) top view



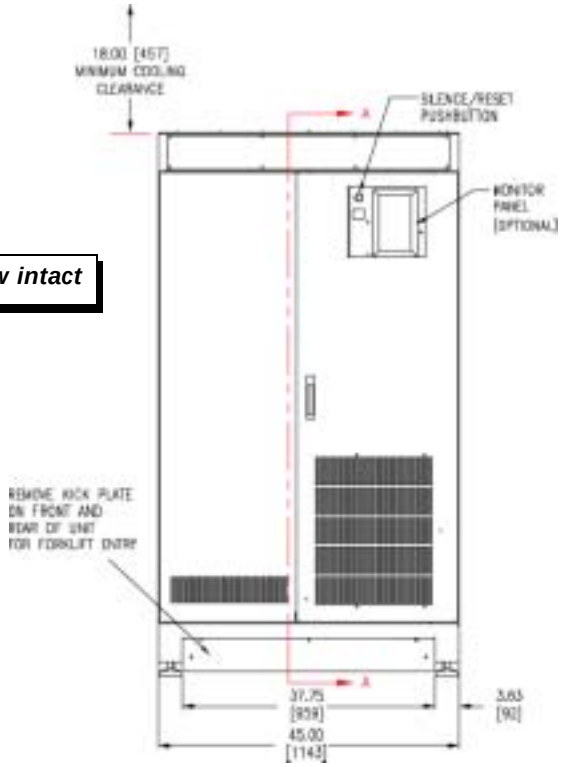


SPDU (75-225[K13]) bottom view

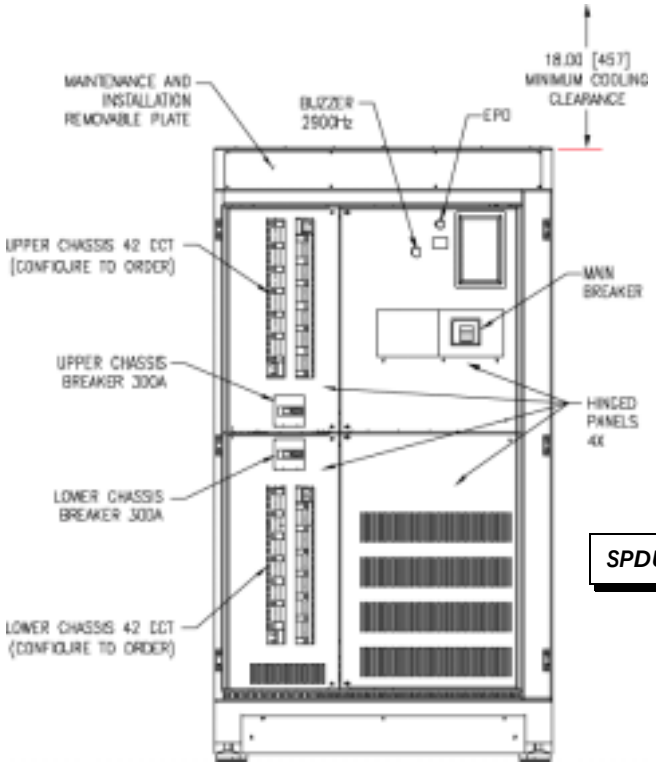
SPDU (75-225[K13]) floor cutout



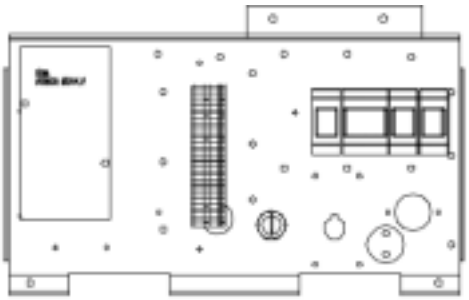
SPDU (225 - 300 kVA)



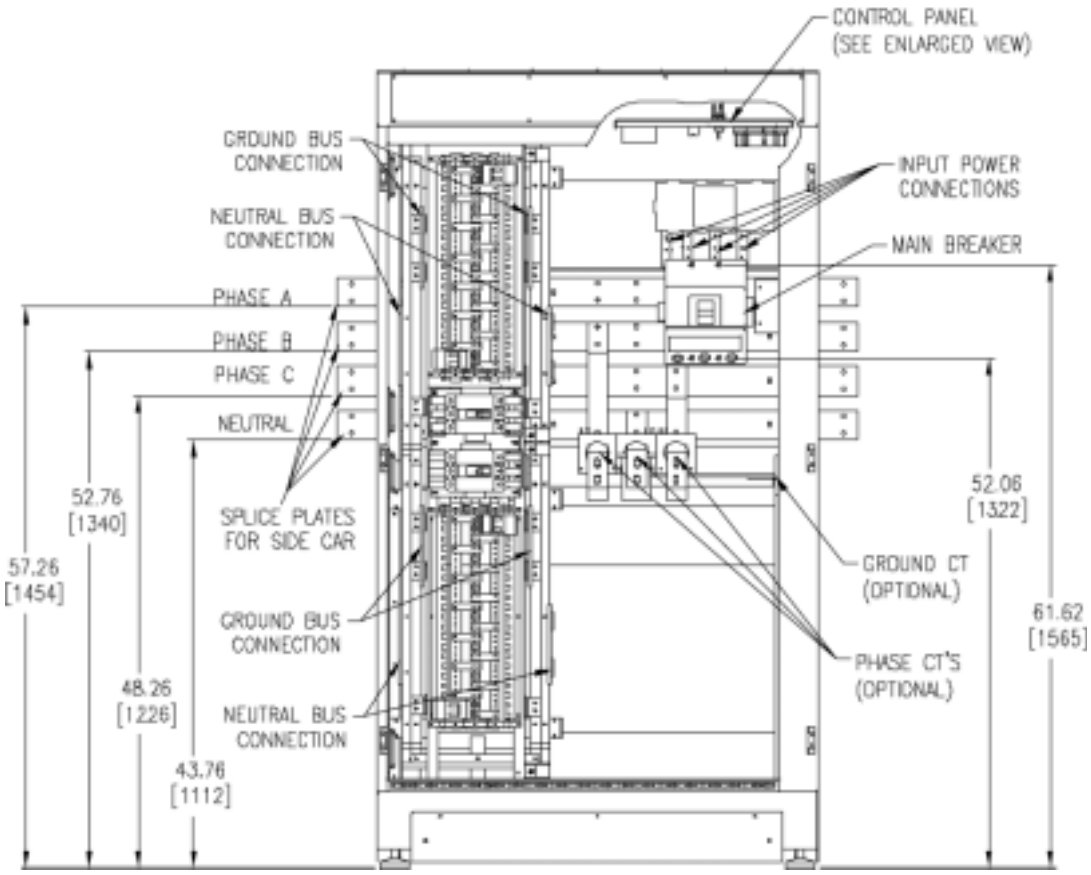
SPDU (300 kVA) front view intact



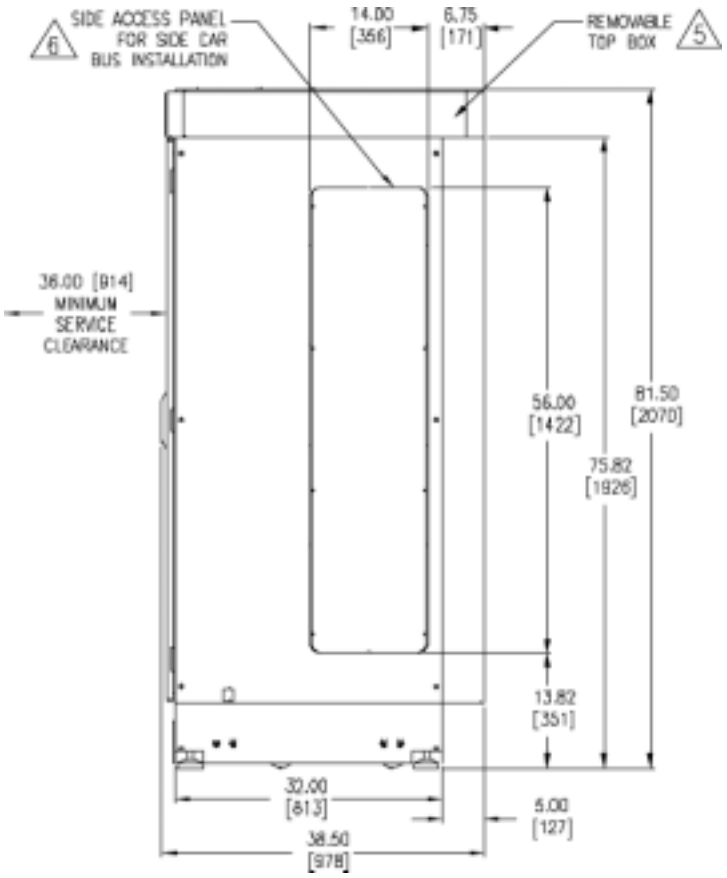
SPDU (300 kVA) front doors removed



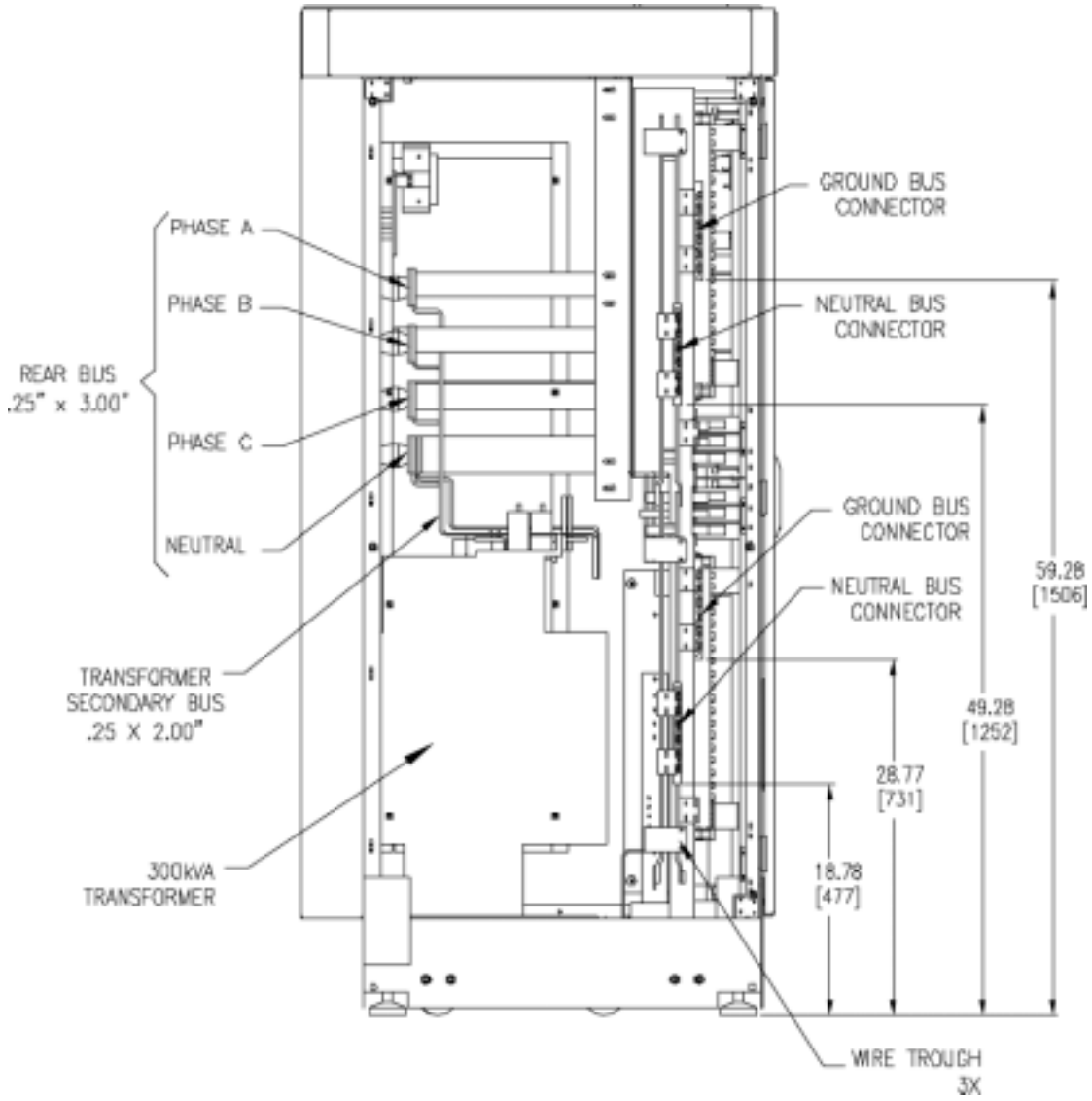
CONTROL PANEL
(ENLARGED VIEW)



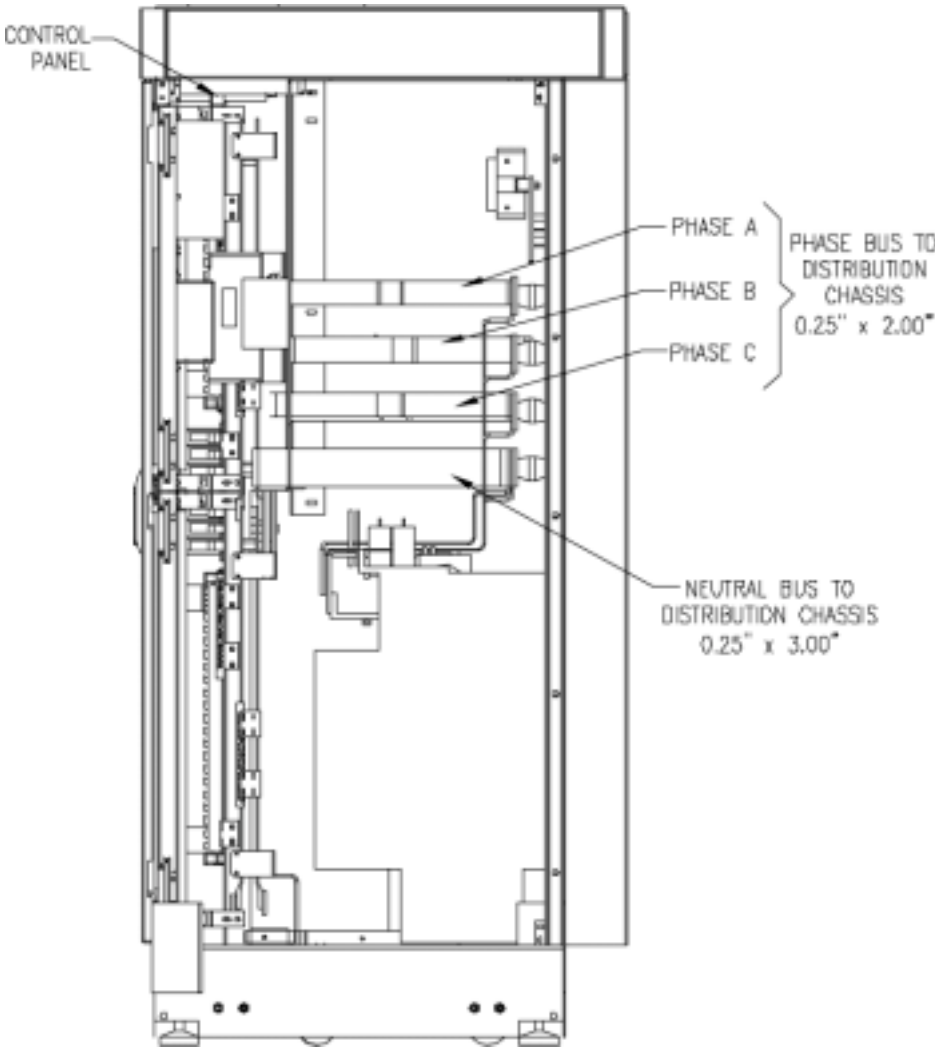
SPDU (300 kVA) front internal components



SPDU (225[K20]-300) right side intact

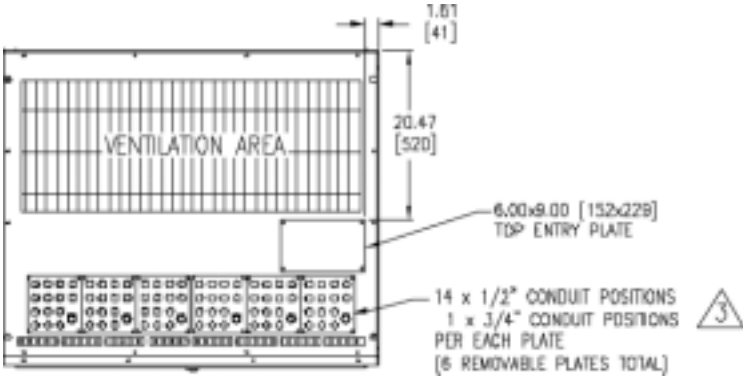


SPDU (225[K20]-300) left side internal components

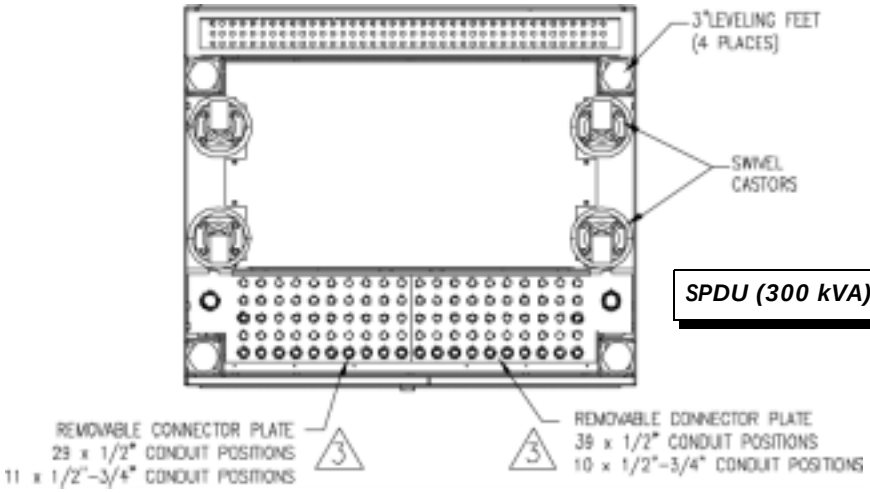

CONTROL PANEL
PHASE A
PHASE B
PHASE C
PHASE BUS TO DISTRIBUTION CHASSIS 0.25" x 2.00"
NEUTRAL BUS TO DISTRIBUTION CHASSIS 0.25" x 3.00"

SPDU (225[K20]-300) right side internal components

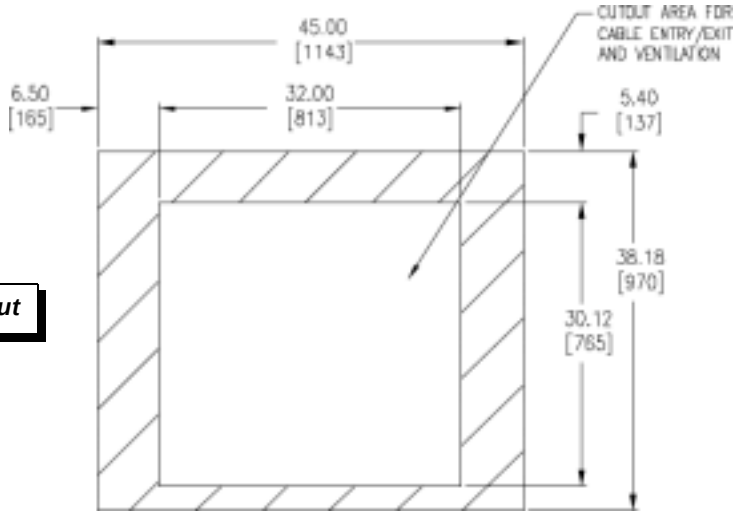
SPDU (300 kVA) top view



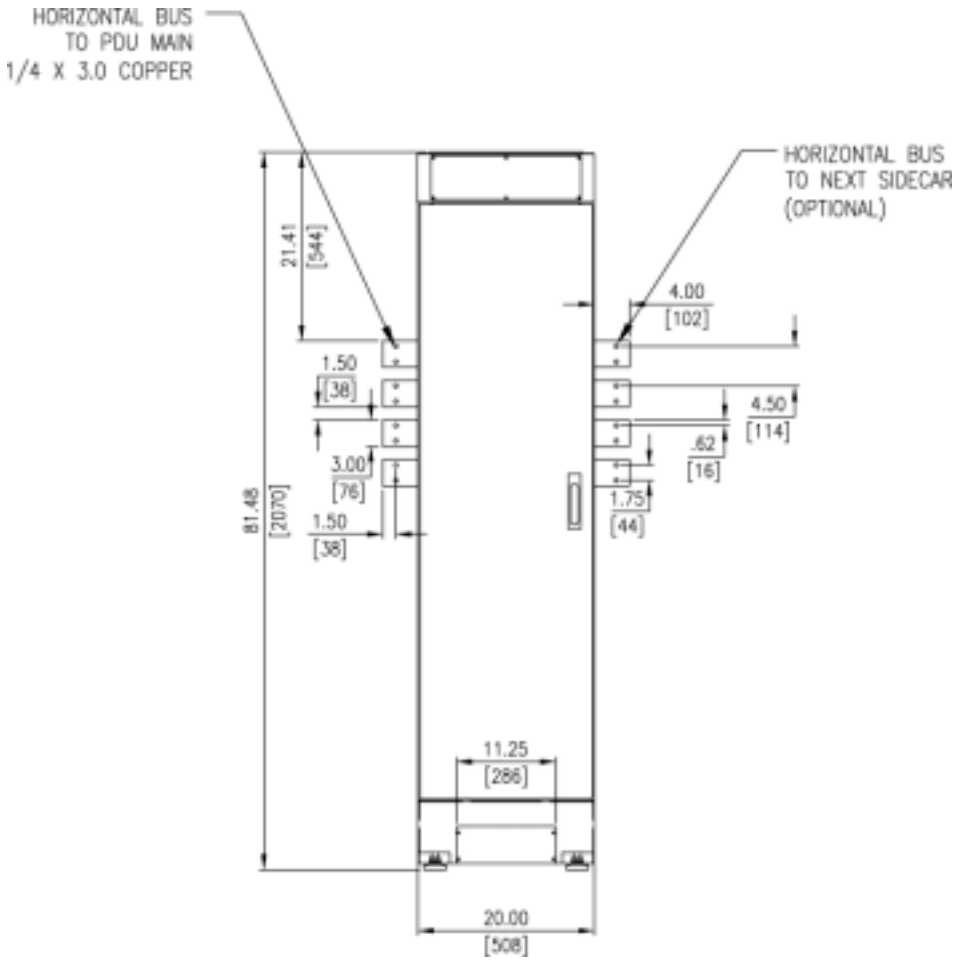
SPDU (300 kVA) bottom view



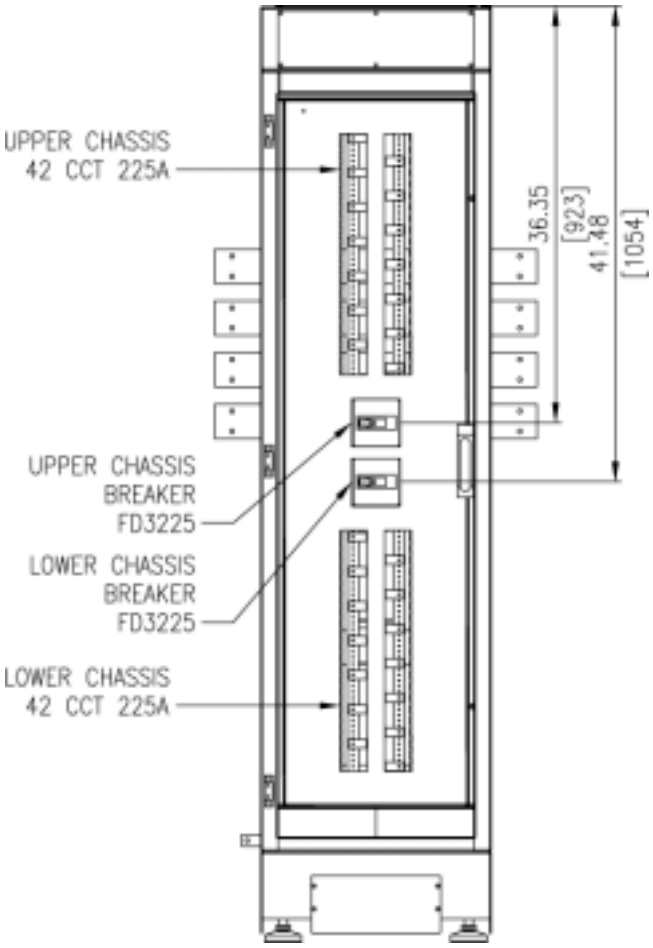
SPDU (300 kVA) floor cutout



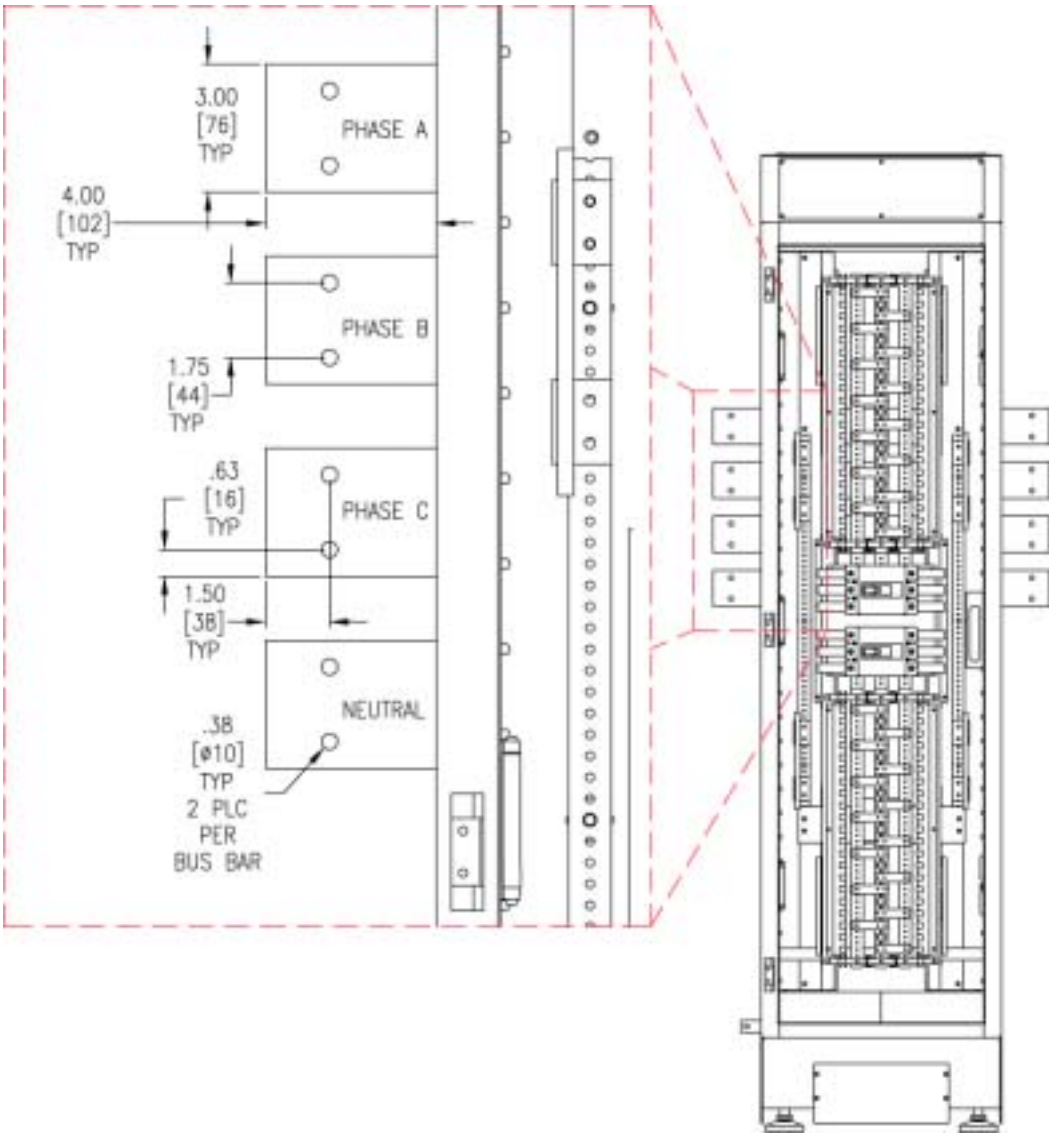
Sidecar (75 - 300 kVA)



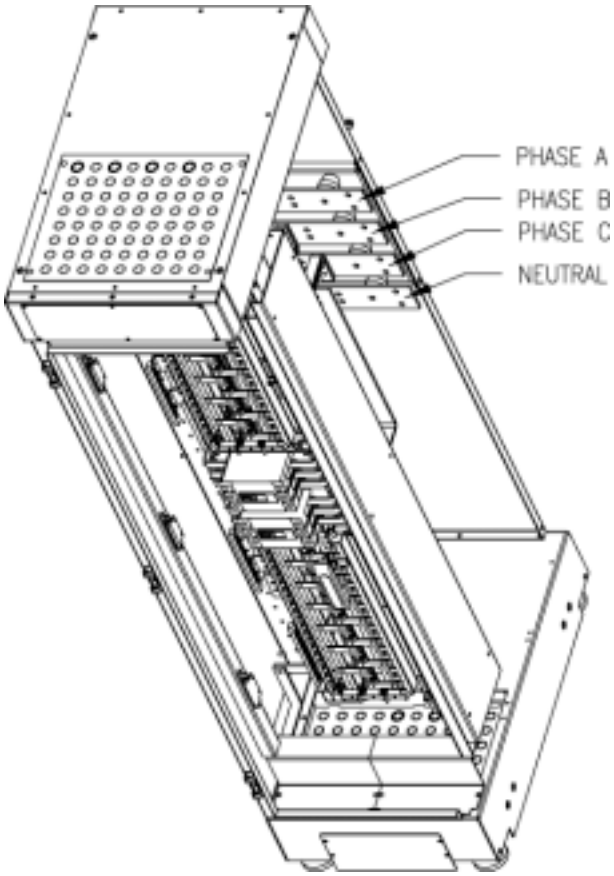
Sidecar (75-300 kVA) front view intact



Sidecar (75-300 kVA) front with door removed

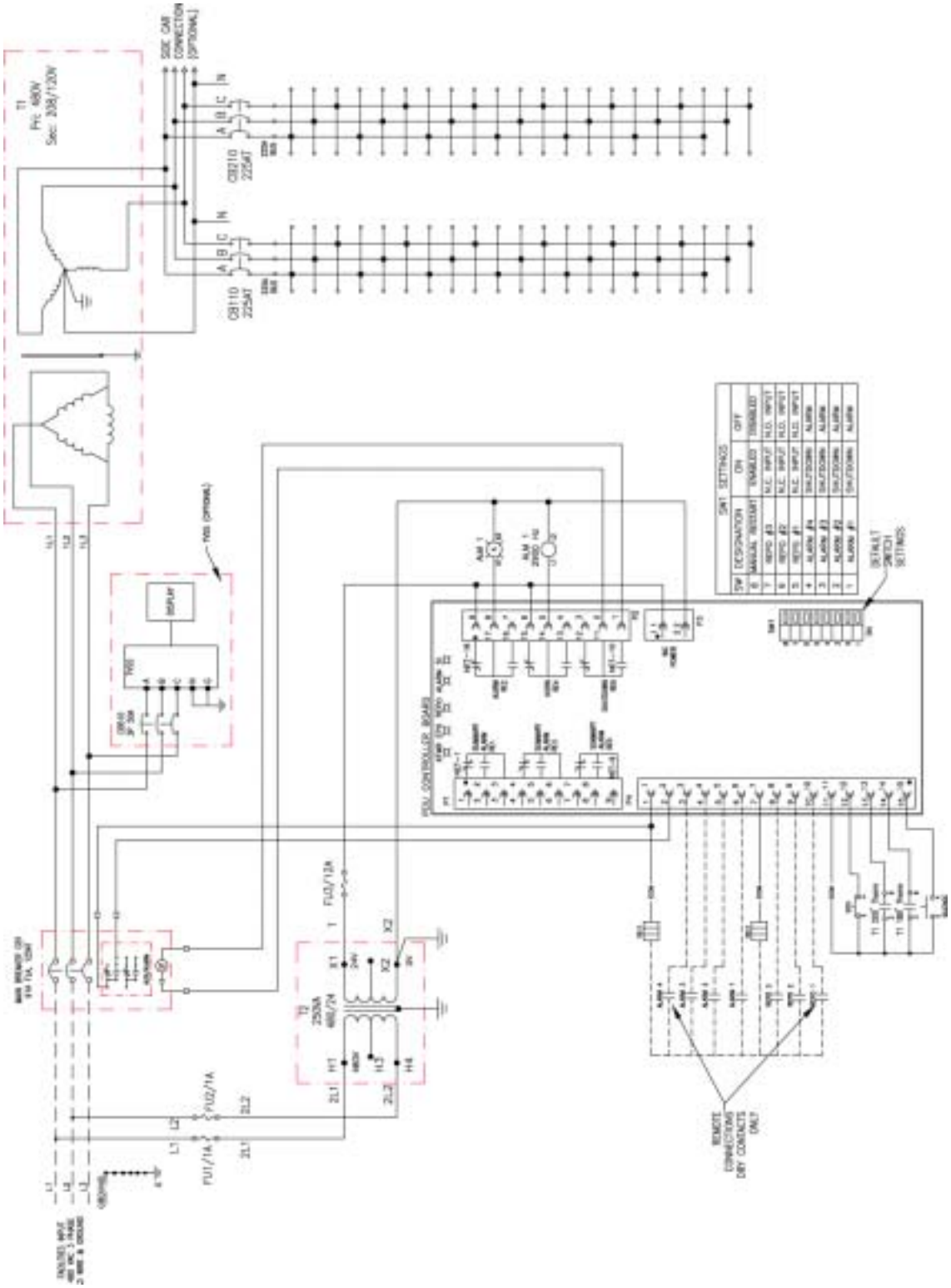


Sidecar (75-300 kVA) front door and trim removed

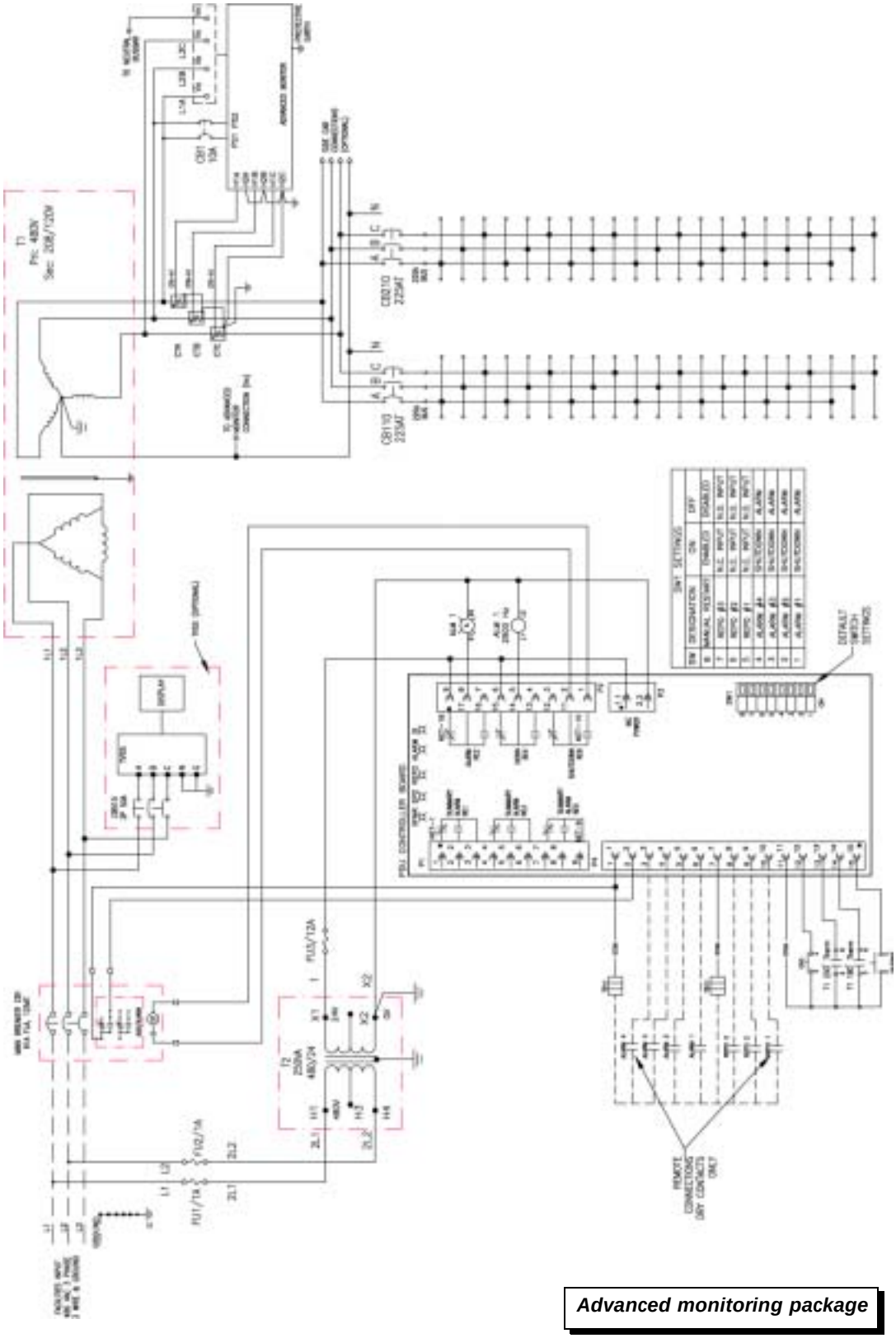


Sidecar (75-300 kVA) isometric view

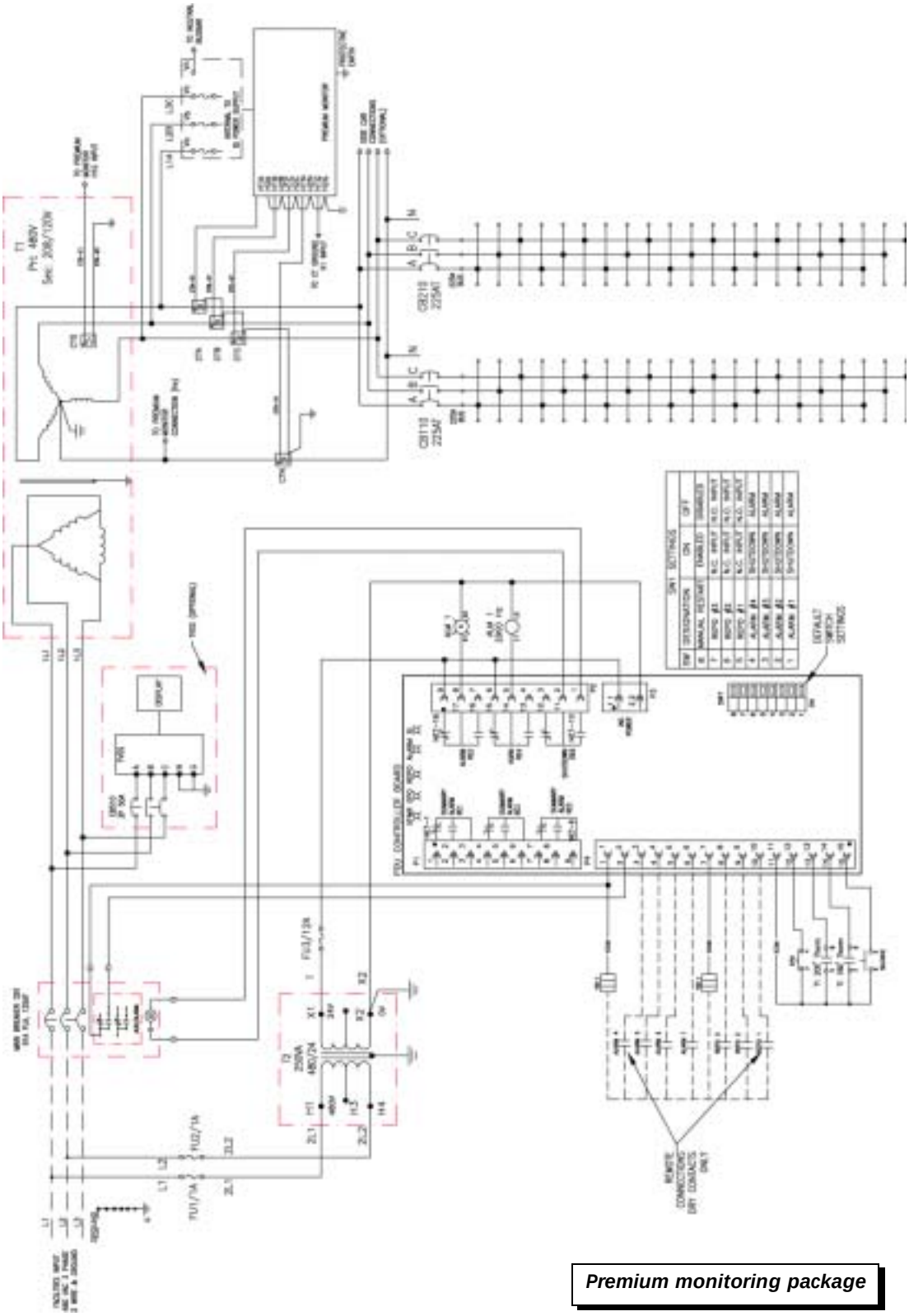
SPDU electrical schematics



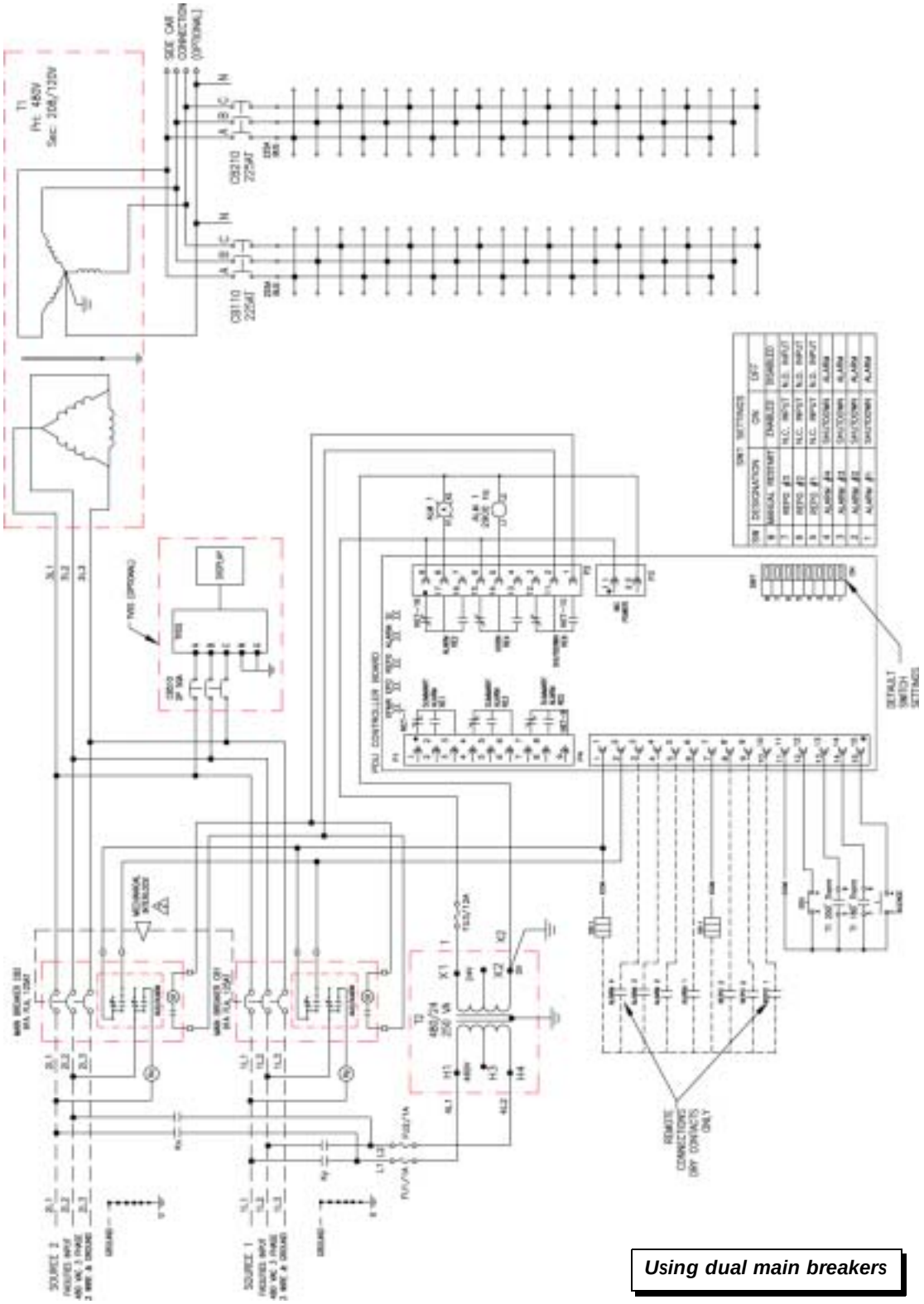
Basic monitoring package



Advanced monitoring package



Premium monitoring package



Using dual main breakers

Section 4: Service and Support

Factory warranty

APC warrants that the Stationary Power Distribution Unit (SPDU), when properly installed and commissioned by APC or APC-authorized service personnel, shall be free from defects in materials and workmanship for a period of one (1) year from the date of installation, or a maximum of 18 months after manufacturing. In the event the unit fails to meet the foregoing warranty, APC shall for a period of one (1) year repair or replace any defective parts without charge for on-site labor and travel.

For comprehensive information on the terms and conditions associated with APC's factory warranty, click the appropriate sub-category under "Warranty Services" on the APC website: http://www.apcc.com/support.

Service contracts

While all APC products are covered under the terms and conditions of the standard APC factory warranty, additional services can be purchase separately. These "addendum" services are specified in the APC Entitlement Certificate, which is formulated at the time the product is purchased.

An Entitlement Certificate allows the customer to pre-purchase an addendum service plan that either becomes effective after the factory warranty expires or provides supplemental services to those services specified under the factory warranty. Extended coverage may be purchased at any time during the original warranty period.

Each product is covered under a separate Entitlement Certificate; therefore, applying service contracts to multiple products would require formulation of multiple Entitlements. It should be noted that Entitlements do not affect or replace the terms and conditions associated with the factory warranty.

Visit the APC website at www.apc.com/support/contact/contact_support.cfm, or call APC Technical Support (800-555-2725) for further information on procuring service contracts.

Contact information

APC Corporate Offices:	APC Corporation 132 Fairgrounds Road West Kingston, RI 02892
Corporate Phone:	(401) 789-0204
Corporate Fax:	(401) 789-3710
Sales Support:	(877) 272-2722
Customer Service:	(877) 800-4272
Technical Support:	(800) 555-2725
PowerFax:	(800) 347-FAXX
Internet:	www.apc.com/support/contact/contact_support.cfm

Section 5: Ordering Process

"Build to order" guidelines

APC's SPDUs are "built to order" as a means of satisfying each customer's unique requirements. The customer is thus given total freedom in selecting an appropriate SPDU model and whatever features and options they would like to have included with that model.

An added bonus of APC's customer-oriented philosophy is the company's willingness to respond to special requests via custom engineering. In essence, the customer is able to request the inclusion of assemblies and components outside the realm of APC-suggested offerings. If the requested items can safely and feasibly be incorporated into the design, then we will make it happen.

Items for consideration

1. The customer first purchases an SPDU enclosure from among the 21 available product SKUs (refer to "Product SKUs." on page 4). The primary variables for consideration are output power (75, 100, 125, 150, 200, 225, or 300 kVA) and transformer type (K1, K13, or K20).

   *For example, the customer opts for SKU# **PD150G6FK13**, which offers 150 kVA of output power and a K13 transformer.*

2. The customer next decides on the contents of the SPDU enclosure with respect to panel boards and/or sub-feed breakers. The possibilities include two 42-pole panel boards; one 42-pole panel board and up to seven 225A sub-feed breakers; up to eleven 225A sub-feed breakers; or up to three 400A sub-feed breakers.

   *For example, the customer opts for **one 42-pole panel board with six 225A sub-feed breakers** (or 1 x p/n PDPNLPL1A and 6 x p/n PDCBRF225SF).*

3. The customer next decides whether to order (one or more) sidecars for the purpose of increasing the SPDU's load distribution capability. The customer must also decide whether to add one or two 42-pole panel boards to their sidecar(s). Sidecars can be attached to either side or both sides of the SPDU and daisy chained, if necessary.

   *For example, the customer opts for **one 75-225[K13] sidecar** (p/n PDSC100), and opts to populate it with **two 42-pole panel boards** (2 x p/n PDPNLPL1A).*

4. The customer next decides which monitoring system to incorporate into the SPDU. Basic monitoring is offered as standard. Advanced measures voltages, current, frequency, and power. Premium provides the most extensive array of functional data, and can be accessed either locally or from a remote location.

   *For example, the customer opts for a **Premium-level monitoring system** (p/n PDPMN100).*

5. The customer finally decides on any other options they may want to include as part of their SPDU package. These options include manual restart, a TVSS, custom painting, floor jacks, full-frame floor stand, and seismic bracing.

   *For example, the customer opts to add **manual restart** (p/n PDMRS100), **blue painted enclosures** (p/n PDCP100) for both the SPDU and its sidecar, and **floor jacks** (PDFJ100) for both enclosures.*

Section 6: SPDU Guide Specifications

The SPDU Guide Specifications document has been formally released as APC part number 990-4174A. The content from that document is presented on the following pages. The actual SPDU Guide Specifications can be accessed electronically through the APC web site at this address:

http://sturgeon.apcc.com/s3tools.nsf/uniqueid/DWET-5MRRS/$File/SPDUGuideSpec(990-4174A).pdf.

PART 1 — GENERAL

1.1 SUMMARY

A. This technical specification describes the electrical characteristics and general requirements for a power conditioning and distribution system. This system shall henceforth be referred to as the Stationary Power Distribution Unit (SPDU).

B. The specified system will be used to distribute, monitor, and control computer-grade power to sensitive electronic equipment and other critical loads.

1.2 STANDARDS

A. Underwriters Laboratories Standard, UL 60950

B. National Electric Code (NFPA 70)

C. National Electrical Manufacturers Association (NEMA)

D. American National Standards Institute (ANSI)

E. National Fire Protection Association (NFPA)

F. Federal Information Processing Standards (FIPS)

G. FCC Part 15 EMI

H. ISO 9001

1.3 SYSTEM DESCRIPTION

A. Electrical Requirements

1. The SPDU must be able to satisfy the following requirements for continuous Output Capacity:
   a. 75 kVA
   b. 100 kVA
   c. 125 kVA
   d. 150 kVA
   e. 200 kVA
   f. 225 kVA
   g. 300 kVA

2. The SPDU must be able to satisfy the following requirements for Input Voltage, while operating at a frequency of 50 Hz or 60 Hz with either three or four wires plus ground:
   a. 208 VAC
   b. 240 VAC
   c. 380 VAC
   d. 400 VAC
   e. 480 VAC
   f. 600 VAC

B. Environmental Requirements

1. The SPDU must be designed for operation in the following conditions:
   a. Operating Temperature: 0°C to +40°C
   b. Storage: -40°C to +60°C
   c. Relative Humidity: 0% to 95%, non-condensing
2. The system's Audible Noise must be less than the ANSI C89 Standard for transformers.

1.4 DOCUMENTATION

A. Equipment Manual: The SPDU manufacturer must furnish an installation manual that comprehensively covers installation, start-up, operation, and maintenance instructions for the specified system.

B. Drawings: The SPDU manufacturer must furnish a comprehensive array of system wiring diagrams, and detailed drawings of all system components.

C. Spare Parts: The SPDU manufacturer must provide a list of recommended spare parts upon request.

1.5 WARRANTY

A. The SPDU manufacturer must guarantee the entire system against defective materials and workmanship for a minimum period of one (1) year from date of delivery, and not to exceed eighteen (18) months from date of factory shipment.

B. In addition, manufacturer-provided start-up services and extended warranties must be made available as options.

1.6 QUALITY ASSURANCE

A. Factory testing must be performed on all SPDU equipment prior to shipment, and the manufacturer must be ISO 9001 certified.

B. Testing must include, though not necessarily be limited to, the following: Quality Control Checks, "Hi-Pot" and Ground Continuity Testing (per UL60950 requirements), and Meter Calibration Tests.

PART 2 — PRODUCT SPECIFICATION

2.1 COMPONENTS

A. The SPDU enclosure must be constructed of welded steel and be a free standing unit. The enclosure must be able to offer both mobility and stability, as the need arises. It should include four (4) 360° swivel casters to support movement and four (4) leveling jacks for stabilization at its final installation location. These component sets should be easily interchangeable.

B. The SPDU enclosure must be constructed in such a way that all servicing—including preventive maintenance, re-torque of all power connections, and (when required) compensation tap changes—can be performed via front access to the unit. Side or rear access should not be required for any of these purposes.

C. A tool must be provided for removing those panels providing access to exposed live parts. Grounding integrity, static protection, and EMI/RFI shielding must be ensured by grounding removable panels to the frame through the use of stranded copper wire.

D. All units must include provisions for properly accommodating both top and bottom cable entry and exit.

E. The SPDU must use natural convection for cooling purposes. Forced air (fan) cooling is expressly forbidden. The convection cooling must allow continuous full load operation without activating the internal over-temperature alarms. There must be no clearance required for cooling purposes in the rear and sides of the unit. Heat rejection must be provided through the protective top of the unit. The protective top must also prohibit entry of foreign material (per UL guidelines).

F. The SPDU enclosure must be designed so as to be able to accept at least four (4) distribution expansion sidecar enclosures. Each sidecar must not exceed 20 inches in width, while providing a minimum of 84 additional circuit breaker pole positions to the system. Each sidecar enclosure must be capable of becoming an integral part of the SPDU system via internal copper busbar power connections. The distribution panels contained in the SPDU and sidecars must face forward, such that additional workspace is not required on the sides of any of these units.

G. The maximum permitted dimensions for the SPDU and sidecar enclosures are as follows:

1. 75-225 kVA units
   a. SPDU
      1.) Height: 81.5”
      2.) Width: 36”
      3.) Depth: 32”
   b. Sidecar
      1.) Height: 81.5”
      2.) Width: 20”
      3.) Depth: 32”
2. 300 kVA units
   a. SPDU
      1.) Height: 81.5”
      2.) Width: 45”
      3.) Depth: 38.5”
   b. Sidecar
      1.) Height: 81.5”
      2.) Width: 20”
      3.) Depth: 38.5”

H. The SPDU’s main input power connections must terminate directly on its main input circuit breaker. These connections must be wholly accessible from the front of the unit, and the use of additional components or junction boxes to support top or bottom entry of the power cables is expressly forbidden.

I. A separate, low-voltage control wiring terminal strip must be provided for connecting Remote Emergency Power Off (REPO) and dry contact relay interfaces. The relay contacts must be rated 10 Amps at 240 VAC.

2.2 MAIN INPUT CIRCUIT BREAKER

A. The SPDU must include a main input circuit breaker that provides over-current protection, while also serving as the principle means for disconnecting primary power to the system. This main breaker must be a molded case circuit breaker (MCCB) having a minimum interrupting rating of 25,000 RMS symmetrical amps at 480 VAC.

B. The main input MCCB must include a 24 VAC shunt trip mechanism and an alarm contact for remotely indicating status.

2.3 ISOLATION TRANSFORMER

A. The SPDU must contain an electrostatically shielded transformer for voltage step-down and isolation purposes. The transformer must be capable of accommodating the kVA, input voltage, and output voltage ratings described in Section 1.3.

B. The isolation transformer must carry either a K1, K13, or K20 rating and include all copper windings.

C. The isolation transformer must be provided with six (6) 2 1/2% full-load compensation taps (two [2] above and four [4] below nominal).

D. The isolation transformer must have the following electrical and constructional characteristics:

1.	Percent Impedance:	3.0 - 5.0%
2.	Full Load Efficiency:	96.5 - 98%
3.	Insulation Class:	Class “H”
4.	Temperature Rise:	150°C

E. The isolation transformer must contain two (2) sets of overload protection devices for monitoring core temperature. The thermal sensors that trigger these devices should be located in each coil of the transformer’s windings. The first set of sensors must be calibrated at 180°C, and the second set at 200°C. In the event of a 180°C core temperature condition, the first overload protection device will initiate local audible and visual alarms and energize the Summary Alarm Relay to signal this status to remote devices. In the event of a 200°C core temperature condition, the second overload protection device will close a set of contacts and initiate an automatic shutdown event.

F. The isolation transformer must be cooled by natural convection.

2.4 MANUAL RESTART OPTION

A. The SPDU must include a manual restart circuit that allows an orderly restart of the system when input power is lost. This circuit will automatically energize the shunt trip mechanism in the main input circuit breaker.

B. A methodology for field deactivation of this feature must be provided.

2.5 EMERGENCY POWER OFF (EPO)

A. The local EPO must include a fully guarded push button labeled “Emergency Power Off.” This button, when pressed, will activate the shunt trip mechanism in the main input circuit breaker.

B. An interface must also be provided for connecting one or more normally open (NO) or normally closed (NC) REPO dry contacts to the EPO circuit.

2.6 COMPUTER-GRADE GROUND

A. The SPDU must include a computer-grade, single-point ground that complies with electronic equipment manufacturer's requirements IEEE 1100-1998.

B. A further requirement is that the neutral point be solidly bonded.

2.7 OUTPUT DISTRIBUTION PANEL BOARDS

A. The SPDU enclosure must be capable of accommodating two 42-pole, 225 amp, 240V, three-phase distribution panel boards. The unit must also be capable of accommodating up to seven 225 amp frame (AF), 3-pole, molded case circuit breakers (MCCBs) in place of one of the 42-pole panel boards, and up to eleven 225 AF MCCBs in place of both 42-pole panel boards.

B. Each distribution panel board must be individually protected by a main input circuit breaker having a short-circuit rating of 65,000 RMS symmetrical amperes at 240 VAC.

C. Each distribution panel board must be constructed with copper busbar, and be capable of accepting 1-pole, 2-pole, and 3-pole circuit breakers that are rated up to 100 amps.

D. Each distribution panel board must include isolated neutral and safety ground bars for terminating branch circuit wiring. These bars should ideally be located on either side of the distribution panel boards to facilitate installation.

2.8 BRANCH CIRCUIT BREAKERS

A. Each branch circuit breaker must provide over-current protection.

B. Each branch circuit breaker must be equipped with three (3) toggle positions: ON, OFF, and TRIPPED.

C. All branch circuit breakers must be 1-pole, 2-pole, and 3-pole types and rated 15 amps through 100 amps.

D. All branch circuit breakers must have a minimum rating of 10,000 RMS symmetrical amperes at 120/240 VAC.

2.9 OUTPUT POWER CABLES

A. The SPDU enclosure must accommodate up to 84 output power cables per 84 pole positions.

B. All output power cables must be able to exit the SPDU at either the top or the bottom of the enclosure.

2.10 MONITORING SYSTEM

A. The SPDU must offer the option of selecting between Basic, Advanced, or Premium-level monitoring systems.

B. Basic Monitoring Parameters

1. The Basic-level monitoring system must continuously monitor the temperature of the electrostatically shielded isolation transformer, the status of the main input circuit breaker, and the status of a remote alarm contact.
2. The monitor will initiate local audible and visual alarms and energize the Summary Alarm Relay (to signal status to remote devices) under the following conditions:
   a. A 180°C transformer core temperature condition.
   b. A 200°C transformer core temperature condition.
   c. Main input circuit breaker tripped.
   d. Remote alarm contact closed.
3. An Alarm Indicator/Reset push button must be located on the front of the SPDU. This push button will be capable of disabling any active audible alarms. The Alarm Indicator and Summary Alarm Relay should not reset until the fault condition has been cleared.

C. Advanced Monitoring Parameters

1. The Advanced-level monitoring system must utilize a microprocessor-based power module that has the capability to sense, process, and display the following:
   a. Output Voltages: Line-to-line for all three phases
   b. Output Voltages: Line-to-neutral for all three phases
   c. Output Current: All three phases
   d. Output Frequency
   e. Output Power: kVA, kW, power factor
   f. Min and Max values: All monitored values

D. Premium Monitoring Parameters

1. The Premium-level monitoring system must utilize a microprocessor-based power monitor that has the capability to sense, process, and display the following:
   a. Output Voltages: Line-to-line for all three phases, plus average
   b. Output Voltages: Line-to-neutral for all three phases, plus average
   c. Output Voltages THD: Line-to-line for all three phases
   d. Output Voltages THD: Line-to-neutral for all three phases
   e. Output Current: All three phases, plus average
   f. Output Current: Neutral
   g. Output Current: Ground
   h. Output Current THD: All three phases and neutral
   i. Output Frequency
   j. Output Power: kVA, kW, power factor
   k. Min and Max values: All above monitored values

l. K Factor
m. Crest Factor
n. Discrete Input and Output Status
o. Analog Input Reading
p. Custom: User programmable display of any combination of up to seven metered values

2. All three phases of three-phase parameters must be displayed simultaneously. All voltage and current parameters must be monitored using true RMS measurements.

E. Premium-level Alarm Annunciation

1. The Premium-level monitoring system must also supervise and annunciate the following:
   a. Output Over Voltage: Line-to-line for all three phases
   b. Output Over Voltage: Line-to-neutral for all three phases
   c. Output Under Voltage: Line-to-line for all three phases
   d. Output Under Voltage: Line-to-neutral for all three phases
   e. Maximum Thresholds:
      1.) Current: All three phases, neutral and ground
      2.) Voltage: Neutral to ground
      3.) System Power: Watts, kVA
      4.) Frequency
      5.) % THD
   f. Minimum Thresholds:
      1.) Current: All three phases
      2.) System Power: Watts, kVA
      3.) Frequency
   g. Voltage Phase Unbalance: Line-to-line for all three phases
   h. Voltage Phase Unbalance: Line-to-neutral for all three phases
   i. Current Phase Unbalance: All three phases
   j. Discrete Input Energized: All discrete inputs
   k. Reverse Sequence Error
2. All Alarms must be stored in non-volatile memory until manually reset.

F. Premium-level Custom Alarm Annunciation

1. The Premium-level monitoring system must also be capable of providing up to four (4) Form C (NO/NC) relay contact enclosure outputs.
2. These relays must be independently programmable to actuate one event condition and/or a combination of metered event conditions.

G. Display

1. The Advanced and Premium-level monitoring systems must also utilize a high visibility, liquid crystal display (LCD) to allow viewing of all monitored parameters and alarms.
2. This LCD must sit within a decorative bezel and be located on the front of the SPDU.

H. Autoscan

1. The Advanced and Premium-level monitoring systems must also include an Autoscan mode, in which the meter continuously displays all monitored parameters and active alarm messages in sequential order.
2. The Autoscan mode must further allow manual interruption so that selected parameters can be displayed.

I. Communications

1. The Premium-level monitoring system must also offer the option of adding a communications interface module.
2. The communications interface module shall be, at a minimum, made available in the following protocols/interfaces:
   a. Ethernet
   b. N2
   c. Web

2.11 OPTIONS

A. Sub-feed Output Circuit Breakers

1. The SPDU must be capable of accommodating up to seven 225 amp frame (AF) 3-pole molded case circuit breakers (MCCBs) in place of one of the 42-pole panel boards, and up to eleven 225 AF MCCBs in place of both 42-pole panel boards.
2. These circuit breakers must be powered ahead of any and all SPDU panel board main breakers, and have a minimum rating of 18,000 RMS symmetrical amperes at 240 VAC.

B. Manual Restart

1. A manual restart circuit must be available that allows for an orderly manual restart of the SPDU in the event input power is lost. This circuit would automatically energize the shunt trip mechanism in the main input circuit breaker.
2. A methodology for field deactivation of this feature must also be made available.

C. Floor Jacks

1. A set of four (4) floor jacks must be available for enclosure leveling, and as a means of providing load relief in raised floor applications.
2. The floor jacks would individually mount to the bottom corners of the SPDU (and the sidecars, if used), and be offered in heights of up to 18 inches with an adjustable range of +/- 3 inches.

D. Full-frame Floor Stand

1. A full-frame floor stand must be available for enclosure leveling, and as a means of providing bottom cable access independent of a raised floor application.
2. The floor stand must be constructed of welded steel, and be offered in heights of up to 32 inches with an adjustable range of +/- 3 inches.

E. Input Surge Arrestor

1. A multi-stage suppression circuit device must be available as a means of arresting input surge. This device would utilize fast-acting 40 mm Metal Oxide Varistors (MOVs) and be connected in a high-energy, parallel design for Category A, B, and C3 applications. Each mode of protection would be individually fused, and contain a thermal cutout to ensure safe operation during severe over-voltages and high fault-current conditions. The device must have an interrupting rating of 100,000 RMS symmetrical amperes, and be capable of withstanding 5,000 Category C3 impulses with less than 10% drift.
2. The suppression circuit device must also have an AC tracking filter to provide wave shapes smoothing. It must further provide a high level of EMI/RFI noise attenuation, as well as electrical noise attenuation of up to -50 db from 100 kHz to 100 MHz. The device must be installed with a minimum conductor length in order to achieve maximum performance.
3. For Basic and Advanced-level monitoring systems, this device should offer a remote monitor that is mounted on the front panel of the SPDU as an added option. For the Premium-level monitoring system, this device should offer an alarm contact that connects with the monitor to annunciate suppression device failures as an added option.

PART 3 — EXECUTION

3.1 SERVICE

A. Factory start-up and user training, preventive maintenance service, and full service for the above-specified system must be included upon request. The manufacturer must also employ an international service organization that consists of factory-trained field service personnel who are dedicated to the start-up, maintenance, and repair of all provided power equipment.

B. The manufacturer must further maintain a full-time (24 hours per day, 365 days per year) call center to provide readily available technical support to end users and to facilitate emergency service dispatching.

End of Section 16460

APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)

    Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**

    Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Japan	(0) 35434-2021
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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